

HINGE STRUCTURE FOR PORTABLE TYPE ELECTRONIC EQUIPMENT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a hinge structure for a portable type electronic equipment.

2. Description of the Prior Art

FIG. 1A is a perspective view showing an example of a hinge structure for a conventional portable type electronic equipment, FIG. 1B is a partial plan view of the hinge portion of FIG. 1A from which the hinge cover is removed, and FIG. 1C is an exploded perspective view of the hinge portion of FIG. 1A.

Referring to FIGS. 1A to 1C, a conventional portable type electronic equipment having a tablet type display 51 has a protection cover 52 for protecting the display 51, and the protection cover 52 and a case 54 of the unit main body are connected to each other with a hinge portion 53. The protection cover 52 is pivoted to be open as shown in FIG. 1A, and information is input.

In order to allow the protection cover 52 to pivot to completely the rear side of the unit main body with a pivot angle of 360°, a pair of shaft projections 56 and 57, and the like respectively formed on the two ends of a flat plate-like hinge case 53a are fitted in a pair of shaft accepting holes formed in the side portions of the case 54 and protection cover 52, so that the protection cover 52 is pivotally connected to the case 54 with two shafts.

As shown in FIG. 1C, the hinge portion 53 is vertically divided in the direction of thickness of its flat plate. At least one of the shaft projections at the two ends of the hinge case 53a that fit in the case 54 constitutes a slide shaft 55 which is a separate component. The other shaft projection 56 integrated with the hinge case 53a is fitted in the shaft accepting hole of the case 54. Thereafter, the slide shaft 55 is slid to connect the protection cover 52 and case 54 with each other.

Afterwards, the shaft projection 57 which is separate from the protection cover 52, and a shaft projection 58 are pressed into the shaft accepting holes of the protection cover 52 to be connected to the protection cover 52, and then a hinge cover 53b is built on the hinge case 53a and fastened by a screw 59.

FIG. 2A is a perspective view showing the carried state of the conventional portable type electronic equipment, and FIG. 2B is a partial enlarged view of an example of the carrying means of FIG. 2A.

When the conventional portable type electronic equipment is to be carried, its protection cover 62 is closed, as shown in FIG. 2A. As an example of the carrying means, a pin 60 is formed on the corner portion of a case 64, and a strap (or chain) 63 having a clip 61 at its distal end is extended through the pin 60, as shown in FIG. 2B. The case 64 is put in the pocket of the clothing, and the clip 61 is caught by the pocket.

“Cover Opening/Closing Mechanism for Compact Electronic Equipment” described in Japanese Unexamined Utility Model Publication No. 5-79982 and “Hinge Mechanism for Electronic Equipment” described in Japanese Unexamined Utility Model Publication No. 5-85078 can be taken as the second and third conventional examples of the technique of this type.

In the second conventional example, a first elastic locking member which is constantly in elastic contact with the outer

circumferential surface of the lower portion of the hinge member is arranged in a main body case, and a second elastic locking member which is constantly in elastic contact with the outer circumferential surface of the upper portion of the hinge member is arranged in the cover case. The hinge member is formed with first and second engaging projections. When the cover case is closed, the first engaging projection elastically engages with the abutment roller of the first elastic locking member to lock the hinge member, and the second engaging projection elastically engages with the abutment roller of the second elastic locking member to lock the hinge member. Hence, a cover opening/closing mechanism which enables an easy opening/closing operation and has a good outer appearance is obtained.

In the third conventional example, the slide portion of a ratchet piece is slidably arranged in a mounting hole formed in the mounting portion of the main body case. A connection shaft is inserted in the second shaft hole of the ratchet piece and the first shaft hole formed in the connecting portion of the cover case to pivotally connect the cover case to the main body case. A leaf spring is arranged between the mounting portion and the ratchet piece. The ratchet piece is elastically urged against the connecting portion of the cover case with this leaf spring, so that the second meshing groove of the ratchet piece meshes with the first meshing groove of the connecting portion. In accordance with the pivot operation of the cover case, meshing of the first and second meshing grooves is sequentially shifted, so that the ratchet piece and the cover case always mesh with each other. Therefore, the cover case cannot be easily removed from the main body case, and the cover case can be fixed at an arbitrary position in the pivot movement.

In the first conventional example, the protection cover and the hinge mechanism portion are undetachably connected to each other. Even when the protection cover is damaged or the user wishes to change the protection cover so that the unit design has variations, the protection cover cannot be exchanged.

Since the hinge does not have a stable frictional resistance when pivoting the protection cover, and the unit does not have a locking means which performs locking at a predetermined hinge pivot angle, even a light touch by the user or an external light vibration applied to the unit may rotate the hinge, impairing the product value.

Since the hinge portion has the shape of a substantially flat plate, when reducing the parts mounting space, the pivot region of the hinge portion must be formed by notching the case of the unit main body.

As the carrying means, a clipped strap is attached to the case so that the electronic equipment can be put in the pocket or be mounted on the user's waist belt. Since the system notebook itself does not have a mounting/detaching means, the electronic equipment cannot be carried around integrally with the system notebook, or the system notebook and the electronic equipment cannot be used to be linked to each other.

The arrangement and structure of the second and third conventional examples are completely different from those of the present invention.

SUMMARY OF THE INVENTION

The present invention has been made in view of the above situation of the conventional technique, and has as its object to provide a hinge structure for a portable type electronic equipment in which the case mounting efficiency and the product value of the portable type electronic equipment are remarkably improved.